

Find the **determinant** to tell whether the matrix has an inverse.

$$8.) \begin{bmatrix} -3 & 2 \\ 9 & -6 \end{bmatrix}$$

$$(-3)(-6) - (9)(2)$$

$$18 - 18$$

**0** No inverse

$$9.) \begin{bmatrix} 3 & 4 \\ 6 & 8 \end{bmatrix}$$

$$(3)(8) - (6)(4)$$

$$24 - 24$$

**0** No inverse

$$10.) \begin{bmatrix} 2 & 1 & 0 \\ 3 & -2 & 1 \\ 2 & 5 & 0 \end{bmatrix} \begin{bmatrix} 2 & 1 \\ 3 & -2 \\ 2 & 5 \end{bmatrix}$$

$$(0 + 2 + 0) - (0 + 10 + 0)$$

$$2 - 10 = -8$$

Yes-inverse

The formula for finding the inverse of a matrix is  $A^{-1} = \frac{1}{\det A} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$ . Use this to find the

inverse of each matrix if possible.

$$11.) \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}$$

$$\det A = 2(3) - (0)(1)$$

$$6 - 0 = 6$$

$$\frac{1}{6} \begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} \frac{1}{2} & -\frac{1}{6} \\ 0 & \frac{1}{3} \end{bmatrix}$$

$$12.) \begin{bmatrix} -4 & 8 \\ 2 & -4 \end{bmatrix}$$

$$\det A = (-4)(-4) - (2)(8)$$

$$16 - 16 = 0$$

inverse does not exist.

$$13.) \text{ Use your calculator to find the inverse } A^{-1}. \begin{bmatrix} 1 & 6 & 2 \\ -2 & 3 & 5 \\ 7 & 12 & -4 \end{bmatrix} = \text{no inverse}$$

Answer the following questions using these matrices.

$$A = \begin{bmatrix} 2 & 3 & -1 \\ 0 & 7 & -11 \\ 3 & 4 & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} 8 & -2 & -7 \\ 9 & 0 & 0 \\ -10 & 3 & -3 \end{bmatrix}$$

14.) What are the dimensions of the matrices? 3x3

A is 3x3

B is 3x3

15.) What is the entry at  $b_{31}$ ? -10

16.) What is  $B + 3A$ ?

$$\begin{bmatrix} 14 & 7 & -10 \\ 9 & 21 & -33 \\ -1 & 15 & 0 \end{bmatrix}$$